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# THE PLOTTER

CLACKAMAS COMPUTER APPLIED  
TRAINING SOCIETY  
NEWS LETTER

**VOLUME 9**              **\*\***              **NUMBER 11**  
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**NOVEMBER 1991**

NOVEMBER 1991

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TREASURER:	ROD GOWEN
PR OFFICER:	BOB EVANS
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# MEETING

The NOVEMBER meeting will be:

on: FRI., NOV. 8, 1991

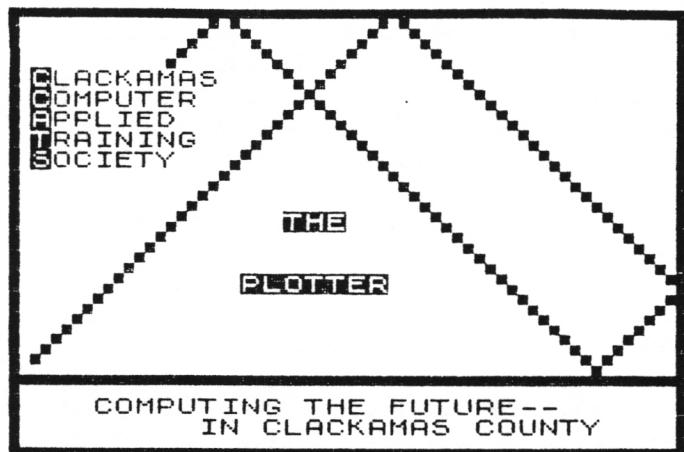
MEETING open at: 7:00 P.M.

in: COMMUNITY ROOM  
FAR WEST FEDERAL BANK  
OREGON CITY SHOPPING CENTER

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## OCTOBER MEETING MINUTES

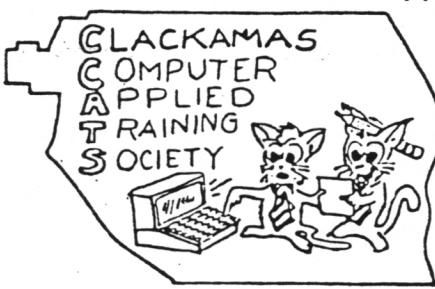
The meeting was called to order by Chairman Jack Armstrong at 8:05 PM. Ten members and a guest were present.

A motion was made and seconded to accept the minutes of the September meeting as printed in the October newsletter. The motion was approved.

Mention was made of the October 19 swap meet conducted by the Portland CP/M Group at Tigard. In conjunction with this announcement, D.S. Lewis introduced Don Taylor of the CP/M group.

Under old businessn Rod Gowen advised members to review their old copies of THE PLOTTER to decide which articles and programs to recommend for inclusion in the proposed "The Best Of The Plotter" publication. He is recommending a final review of these recommendations by the end of the year. Articles and programs originating with the members are prefered. However, we may consider programs from other sources except from other user group publications. We should also carefully review old programs.

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Continued from page 1  
and up-date them if necessary, plus instructions should revised if necessary. Rod reports a backlog of 6 orders at this date.

Donald Malm offered the use of a paper punch and plastic binder machine to bind the copies of the publication. There were suggestions of sources of supplies for binding. Rod thought that we could produce a publication of about 80 pages that could be sold for the range of \$7 to \$8. Hopefully we could provide a discount to user groups with group purchasing. If all of this can be done with concerted effort, it seems possible that we could make deliveries in March-April.

Under new business, members were questioning if any one had heard of Syd Wyncoop since D.S. Lewis last saw him. It seems that there is no new news.

Don Taylor is interested in locating a Z88 computer in good condition. It was suggested that we include a want add in the next issue to see if we can assist him in locating such a computer.

As a new development, Rod reported that Sir Clive has developed a super fast computer system using parallel CPUs. There are several companies in the U.S. interested in this development and are in process of negotiating its use.

Rod also mentioned that the 10th anniversary of the founding of our user group passed last month without notice. He is in process of writing the history of our organization and should have it ready for the next issue. It so happens that September was also the 9th anniversary of the our newsletter. In honor of this occasion Rod has brought a very nice looking cake to be enjoyed by every one after the meeting.

Bob Gerow reported that his wife was recovering very nicely from a recent heart operation. It seems that a natural valve required some repair work and this was accomplished without difficulty.

The meeting was adjourned at 8:55 PM after the chairman pointed out that Ed Fry had a computer controlled mechanical arm ready for demonstration. This is a machine that raises and lowers it's arm, rotates almost 360 degrees, and is able to grasp objects and reposition them at selected locations. At present it is stationary in location but Ed has hopes of making it mobile to some extent. Interestingly, the 3 motors are DC continuous running instead of the usual stepping motor configuration.

Dick F. Wagner  
Secretary

## BITS & BYTES

by: Rod Gowen

In this column I try to bring you the latest and complete information and news available to me regarding the world of TS computing. One way that I can accomplish this is if I have the support of you, the reader, in collecting news that may be of interest to other readers. If you have any news, rumors or other tidbits of information that fits this description, why not send it along? We will be watching!

## ELECTION TIME AGAIN==!=

As always, November is the month for all good members to come to the aid of their group. We must nominate new leadership. If you have any ideas or suggestions, just show up and air them. Seems as though those paid members who miss this meeting sometimes end up nominated! You must be there to defend yourself. Do we have anyone who will step up and volunteer? See you there!

## T/SNUG NEWS-

Received a letter from Don Lambert a couple of days ago and he tells me that the next ZXir Clive Alive newsletter is in the works.. He went on to say that there have been a lot of contributors and that there should not be a shortage of material for a while. All we have to do is continue to support the idea and the group.

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## RMG NEWS:

As I said last time, the Zebra program package on disk had arrived but there were a couple of bug fixes required and it cannot be shipped until they are corrected. The corrected disks should arrive within the next week or so and then those of you who have been waiting patiently will be able to receive the program package. If you have been waiting, we thank you. It will be available in both Larken and Olicer formats. For more information, call or write RMG.

## "THE BEST OF"-PROJECT:

Last month we reported on a new group project which involves putting together a "Best Of" book of the articles and programs which have appeared in past issues of THE PLOTTER newsletter. We are continuing with this project and would like to hear from members who have a complete or even partial collection of THE PLOTTER as to what you would like to see included in the book. Dick Wagner is putting together a list of all of the original items that have appeared as a guide. I think that we can make copies of this list available if you would like one. Just let us know. We want to get this thing going and hope to see something available for distribution early in 1992. Join in! Give a hand to your group!

That's if for now!

See you next time. . .

## **DID YOU KNOW?**

The first computer adventure game (text) was written in the mid-1970s by a William Crowther with Fortran language for very large computers. It required 2-word answers. It was improved upon by a Don Woods. The game was called variously, Adventure, Colossal Cave Adventure, and after other games followed, The Original Adventure.

Microcomputers had their first adventure game by a Scott Adams. Programmers from MIT, in the late 1970s, wrote another version of Adventure and called it ZORK. It has sequals by this time. ZORK was different as it would accept entire sentences as answers.

## **10 Years Later-**

### -A Retrospective

by: Rod Gowen

Has it really been 10 YEARS!! I guess the old adage is true--"time flies when you're having fun". It really does not seem possible that it was 10 years ago, Sept. 1981, when Bob Evans, Dennis Jurries and a couple of others met officially for the first time. Our first meeting place was on the corner of Molalla Avenue and Beavercreek Road in a former fireplace shop that was being used at the time by one of our first members, Quentin Rippey, for his foam rubber and styrofoam business. How many of you current members can remember this? How many of you remember Dennis Jurries, our co-founder? Do you know that we still have 3 of the first 4 members actively participating in our club? If you didn't, they are Bob Evans, membership #2, Rod Gowen, #3, and Dick Wagner, #4. I wonder how many other TS user groups can say the same? I wonder how many of the existing clubs are 10 years old?

### The Beginnings. . .

But, I am getting a bit off the subject. In this case, a look back on my 10 years with this great group! I can honestly say that I have enjoyed every bit of the time spent with our members. I can, as acting Treasurer of the group, say that I have met every one of the 87 people that have passed through our little group on their way through the ever-changing world of computers. I have collected dues from almost all of them. I will say that our first secretary/treasurer, Don Paul, did a fine job for the first year or so of our existence. Don, by the way, was, to the best of my knowledge, our only British born member. Our members' ages have ranged from 12 years of age to 76 years young. I think that the average age of our members over the years must be around 50-55 years old. I believe our current paid-up member list numbers about 15-18 die-hard TS supporters.

### The Places. . .

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A brief history of our group will

follow us through our various meeting places and some of our events and high points. As I said earlier, our first meeting place was in an empty fireplace store where we had to bring our own chairs and tables. From there we moved to Clackamas Community College where we met on the 2nd Thursday of the month as the college campus was closed at 5 PM on Fridays during the summer. From there we moved to our present location, the Far West Federal Bank community room in the Oregon City Shopping Center where we have been meeting on the 2nd Friday of the month (except for rare occasions) ever since. Some of the events in our short history lesson have been the dinner meetings that have been held 3 times and the swap meets that have also been held 3 times. We were also fortunate enough to have participated in 3 "mini-fairs" over the years. The first, at the home of the now defunct magazine, Time Designs, in 1986. The second, in Seattle, in 1987, and the final one (and the biggest) in Portland in 1988. This last, THE 3RD ANNUAL GREAT NW TS MINI FAIR was co-produced by RMG Enterprises and Time Designs Magazine and was hosted by our group. A lot of group effort and cooperation went into some of these events and I feel that they, along with the continued comradery, have made being a member of CCATS well worth the effort.

#### RMG. . .

As most of you know, I own and operate RMG Enterprises, perhaps the world's largest remaining TS dealer. It may interest you to note that the formation of the computer portion of RMG runs parallel to that of CCATS. I ordered my first Sinclair ZX-81 from England in the fall of 1980 and received it just after Christmas of 1980. I then started looking at sources for software and impatiently awaited the release of the forthcoming printer and other promised add-ons. When, after 6 months of experimenting and learning, I learned of a local man doing the same thing I was doing, and, as the Timex Corporation had announced plans to market the Timex Sinclair 1000 in the U.S., was actively promoting the new \$99

computer in local stores, I contacted him. Dennis Jurries was his name. He had already been contacted by Bob Evans and this was the basis for our present group. I started out by buying up items that the members of the group were interested in and could assure them of a lower price if I were to buy in bulk. I worked a full-time job and did the computer business on the side until 1985 when I was laid off from my 15 year job and decided to take a chance and go with the mail-order computer business full-time. It worked out well for both CCATS and RMG. In todays market I could never make a living selling exclusively to the TS market. RMG has broadened its base to include IBM clones and related peripherals in order to keep ahead of the bills. The group, as individuals and as a whole has had a slight edge due to having RMG as a member and RMG had a small but dedicated built-in customer base. I have appreciated the business over the past 10 years and I am sure (folks have told me so) that the members of the group have enjoyed having a "local dealer" instead of having to do everything by mail.

#### The Newsletter. . .

Our fine newsletter, THE PLOTTER, is not quite as old as the group. It premiered in September of 1982 and has been in continuous publication ever since. It has been published 11 times per year minimum for 9 years. The first issue was a 2 page affair with no name or graphics. It was printed on my first Gorilla Banana 80 column printer using Memotext on my ZX-81 with the Memotech Centronics interface. We had a name by the second issue and were off and running. It slowly grew and evolved over the years. It stabilized at 8 pages and I edited and published it with some help from Dennis Jurries until 1985 when our current editor, Dick Wagner, took over..I, for one, applaud him and congratulate him on a job well done for the past 6 years! The job of newsletter editor, as any of them can tell you, is a thankless job at its best. With reader input always low, it can take a lot of time to do a credible job of putting together a publication

that is both informative and entertaining.

## The Computers . . .

The last part of my "group history" has to be the history of the computers that we have used and loved for the past 10 years themselves. As I noted above, some of us started out with the second computer that Sir Clive Sinclair put on the market, the ZX-81. I venture to say, however, that the majority of our members have started with the TS 1000. Sir Clive started with the ZX-80 in the fall of 1979 and went to the ZX-81 in the fall of 1980. He followed that with the ZX-Spectrum and ultimately, with the Sinclair QL (Quantum Leap). His historic agreement with Timex to manufacture and market the U. S. version of the ZX-81, to be known as the TS 1000 gave us the push we needed to get our group going and to sustain it. Timex followed the 1000 with the TS 1500 which was basically a TS 1000 in a silver Spectrum case, has the advantage of having 16K of ram onboard and a much better rubber key keyboard. This unit made its appearance in late 1982 to be followed within 2 months by the much heralded TS 2068. This was to be the "ultimate" \$200 computer! With 72K of ram (37.5K usable), sound, color and high resolution graphics it sure looked like it! The 2068 finally arrived in stores and at RMG in late November of 1982 and was selling quite well. Little did we know that 3 months later Timex would perform the ultimate "dump" on all of us who were so avidly supporting their computers! The first week in February of 1983 Timex Computer Corp. announced that they were calling it quits and that was that!

Things were far from over though. There were many loyal dealers and third party software/hardware producers who were to stand by us for several more years. Some saw the Timex pull-out as the end and quit within weeks of Timex. The ones that remained were the basis of a long and, for most of us, enjoyable life with our computers. Almost EVERY major peripheral for the 2068 appeared AFTER Timex had already quit!

A company in Texas called AERCO (Acme Electric Robot Co.) was the first to produce and market a disk drive system for the ZX-81/1000 and the 2068. Another company called COMPUSA also had a disk drive for the ZX-81/1000. Another company in California, A&J MICRODRIVE, came out with small, less expensive "stringy-floppy" high-speed tape drives for the ZX-81/1000 and the 2068 about the same time as Aerco's disk drives. This was based on the older CAI String Floppy system from England. Before long, we had more disk systems available from LARKEN ELECTRONICS, THE JOHN OLIGER CO. and even an import from Portugal in the form of THE TIMEX TOS DISK SYSTEM. This was to have been the disk system that Timex would have marketed in the U.S. for our computers. The only major difference in the Portuguese version was the fact that their 2068 had a Spectrum compatible bus. In the years since, the clear-cut system of choice seems to be the LARKEN LKDOS system. LARKEN also developed a 256K ramdisk and had the foresight to produce code on a DOS cartridge to enable most of the other disk systems to use his DOS (Disk Operating System).

The first modem available for the TS computers was produced by BYTE-BACK CO., the MD-2B for the TS1000, to be followed by the first one for the 2068 called the MD-68. Even though Timex was ready to release the TS-2050 modem to work with all of the TS computers, at the last minute they refused to take delivery of the 100,000 units that a company called Westridge was waiting to ship when they called it quits. It was almost 6 months after the demise of Timex Computer Corp. before we saw the promised Timex 2050 modem hit the market under the name of the producer, WESTRIDGE. As a 300 baud modem with no software to allow for downloads on the 1000, this was a limited but effective modem. It wasn't too long before folks were looking for an alternative. Enter the need for an RS232 port.

Byte-Back was the first with an RS232 for the 1000 and then for the 2068. Problem was, they were one of

the first to quit within a year or so of Timex quitting. Aerco had and still has a dual RS232 port available for the 2068 but it had a very high price tag: \$100! A schematic appeared in Time Designs Magazine that told how to convert one of the thousands of 2050 boards to an RS232 port. A company called ED GREY ENTERPRISES in Los Angeles put out the ZSI/O Port as a kit and it has long since sold out. At the time of this writing the only commercially available RS232 port is the AERCO dual port. There have been rumors of a new one coming from Larken, but we will not hold our breath. With the use of these ports we were able to make use of the 1200 baud modems and make telecommunications more efficient. There are still several BBS systems around the country for the TS users, as well as a forum on Compuserve.

Aerco produced one of the first parallel printer interfaces for the ZX-81/1000 and the 2068. A British company, MEMOTECH, set up a base of operations in Denver, CO, and sold a wide variety of hardware for the ZX-81 /1000 in this country. A young Canadian, Peter Hacksel, also put out a parallel port in two models: one for the rear bus and one to fit into the cartridge port. It was fully compatible with the Aerco model. In point of fact, the Aerco has been almost universally accepted as the standard for the 2068. There were others: the TASMAN units from England and the OLIGER interface. The OLIGER unit is still available as is the Aerco CP-68. Many printer driver packages have been written and many are still available.

Now that we have 80 column printers, 1200 baud modems and disk drive systems, what more could we want? Well, it seems as though we are never satisfied. There is always something that folks will want. We have had video digitizers introduced as well as voice recognition and voice synthesizer systems. We have had some fabulous software written for the 2068 and well as a lot of the British Spectrum software imported and some of it converted for the stock 2068. As long as we keep active and curious, there will

be a few more good years for the 2068. As for the 1000, it is still in strong demand by experimenters and ham radio operators because it is so easy to set up as a control device, a "programmable" controller.

## CONCLUSIONS. . .

I know that this piece cannot begin to cover the complete story. I have not even begun to list all of the software and hardware that was and is available for the TS line of computers. I have not mentioned the many computer shows and fests that have been held over the years or the many user groups that were and still are active across North America. I do not have the room to talk about all of what has passed before me in the past 10 years. All I am trying to do here is to jog your memories, to try to capture a little of the excitement that has held us together for the past 10 years and will continue to do so in the future. I know that I have enjoyed each and every one of those years and I know that those of you who have been with us for a long while must also have enjoyed yourselves else why would you have stuck around? I am looking ahead and would like to see where we are 10 years from now! I do know one thing for sure: as long as there is a customer out there who wants to buy a TS product, RMG and I will be here to try to help. If there is a CCATS group, I will be a part of it.

## WILL YOU?

DID YOU KNOW? NO. 2  
PC-DOS dates back to 1980 when Seattle Computer Products needed an operating system for a board-level 8086 microprocessor for S-100 systems. It was called QDOS. A Tim Paterson was the father of QDOS. He named it QDOS because it was a quick and dirty operating system.

QDOS rapidly improved and became 86-DOS. Microsoft bought the rights to 86-DOS. Microsoft used this program as a base for PC DOS when IBM was looking for an operating system to be used on their prototype PC. Microsoft then purchased Seattle Computer to acquire full rights on this operating system. This was the what MS-DOS has been built on.

# ***the plotter***

## **pc page**

*by: Rod Gowen*

Fall is definitely upon us, even though nature has seen fit to keep a good portion of the country under the sun. I, for one, am not unhappy about it. It does, however, make us a bit hesitant to spend time indoors on our computers. Winter will be here soon enough and a lot of us do not have the luxury of not working on our computers. After all, my business IS computers! Let me know if there is something you need help with, I will do my best to help.

This month I am going to turn the remaining space on the PC PAGE to Dick Wagner as he tells me he has a rather long program to insert here. I hope you enjoy it and I will be back next time.

### **FINANCIAL PROGRAM**

Dick F. Wagner

This main program consists of 10 modules for calculating compound interest, loans, and savings. The various modules contain the same variables names, initial deposit (A), interest rate (I), future value (V), number of years (T), and the number of times the principal is compounded per year (TY).

The modules are from the book, "80 Practical Time-saving Programs For The TRS-80" by Charles J. Carroll. Several errors were noted in the author's/printer's work and corrected. However, I cannot be responsible for the result of any of the modules. If possible, the results should be checked against other sources. The inputs provided by the author checked with his results for each module. One of the author's modules was left out as it was questionable as to results.

If the user wishes to check the listing of each module, just use LIST n1-n2 where n1 is the beginning line number such as 300 and n2 is the last possible line number in that series as 399. No module exceeds such series of numbers. The series is 1-99, 100-199, 200-299, 300-399, 400-499, 500-599, 600-699, 700-799, 800-899, 1000-1099, and 1100-1199. This is easier than to show the complete listing scrolling.

GWBASIC is similar to Sinclair Basic in some respects. However, LET, is not required and --";P;"-- is not required as for "P" with text on each side. GOTO is handled differently as seen in line 75. The 110, 210, etc are the first active lines of each module. Inputs are treated in consecutive order as 1, 2, etc.

From this information it is possible to convert this program to Sinclair Basic, both 2068 and TS1000.

»»»

5 'BY DICK WAGNER. MODULES ARE PROGRAMS FROM THE BOOK, "BO PRACTICAL TIME-SAVING

PROGRAMS FOR THE TRS-BO" BY CHARLES J. CARROLL. SOME HAVE BEEN MODIFIED AND THE

SINGLE PROGRAM HAS BEEN MADE TO COMBINE THE MODULES.

10 PRINT "FINANCIAL CALCULATIONS FOR LOANS, SAVINGS, AND COMPOUND INTEREST"

15 PRINT "VARIABLES ARE-INITIAL DEPOSIT (A), INTEREST RATE (I), FUTURE VALUE (V), NUMBER OF YEARS, (T), AND NUMBER OF TIMES PER YEAR PRINCIPAL IS COMPOUNDED (TY)."

20 PRINT "(1) COMPOUND INTEREST"

25 PRINT "(2) COMPOUND INTEREST TO ACHIEVE DESIRED AMOUNT"

30 PRINT "(3) RATE OF RETURN IN PER CENT PER YEAR"

35 PRINT "(4) FUTURE VALUE"

40 PRINT "(5) MONTHLY PAYMENT TO OBTAIN DESIRED AMOUNT"

45 PRINT "(6) MONTHLY PAYMENTS FOR AMOUNT TO BE FINANCED"

50 PRINT "(7) MONTHLY LOAN PAYMENT"

55 PRINT "(8) LOAN BALANCE AT END OF ANY BLOCK OF PAYMENT PERIODS"

60 PRINT "(9) AFFORDABLE LOAN AMOUNT"

65 PRINT "(10) SINKING FUND"

70 INPUT "SELECT TYPE OF FINANCIAL CALCULATION DESIRED, FROM 1 TO 10 AND ENTER T

HE NUMBER ";X

73 IF X<1 OR X>10 GOTO 10

75 ON X GOTO 110,210,310,410,510,610,710,810,1010,1110

80 END

100 'COMPOUND INTEREST

110 CLS

120 INPUT "ENTER AMOUNT TO BE COMPOUNDED ";A

130 INPUT "ENTER INTEREST RATE ";I:I=I/100

140 INPUT "ENTER NUMBER OF YEARS MONEY IS TO COMPOUND";T

150 INPUT "ENTER NUMBER OF COMPOUND PERIODS PER YEAR ";TY

160 V=A\*(1+I/TY)^(TY\*T)

170 PRINT \$"INT(V\*100+.5)/100"COMPOUND INTEREST FOR "T" YEARS"

180 END

200 'COMPOUND INTEREST

210 CLS

220 INPUT "ENTER AMOUNT TO BE COMPOUNDED ";A

230 INPUT "ENTER INTEREST RATE ";I:I=I/100

240 INPUT "ENTER FINAL DESIRED AMOUNT ";V

250 INPUT "ENTER NUMBER OF COMPOUND PERIODS PER YEAR ";TY

260 T=LOG(V/A)/(LOG(1+I/TY)\*TY)

270 PRINT "COMPOUND ";TY;"TIMES PER YEAR WILL REQUIRE THE MONEY TO BE DEPOSITED "

;INT(T\*10+.5)/10; "YEARS"

280 END

300 'RATE OF RETURN

310 CLS

320 INPUT "ENTER AMOUNT TO BE COMPOUNDED ";A

330 INPUT "ENTER FINAL AMOUNT ";V

340 INPUT "ENTER NUMBER OF YEARS MONEY IS TO BE COMPOUNDED ";T

350 INPUT "ENTER NUMBER OF COMPOUND PERIODS PER YEAR ";TY

360 I=((V/A)^(1/(TY\*T))-1)\*TY

370 PRINT "RATE OF RETURN IS "I\*100" PERCENT PER YEAR"

380 END

400 'FUTURE VALUE

410 CLS

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420 INPUT "ENTER AMOUNT OF MONTHLY DEPOSITS ";A
430 INPUT "ENTER INTEREST RATE ";I:I=I/1200
440 INPUT "ENTER NUMBER OF YEARS ";T:T=T*12
450 FV=A/I*((1+I)^(T+1)-(1+I))
460 PRINT "$"INT(FV*100+.5)/100
470 END
500 'PAYMENT FOR AMOUNT
510 CLS
520 INPUT "ENTER FINAL DESIRED AMOUNT ";FV
530 INPUT "ENTER INTEREST RATE ";I:I=I/1200
540 INPUT "ENTER NUMBER OF YEARS ";T:T=T*12
550 A=(FV*I)/((1+I)^(T+1)-(1+I))
560 PRINT "$" INT(A*100+.5)/100 "MONTHLY PAYMENTS"
570 END
600 'NUMBER OF PAYMENTS
610 CLS
620 INPUT "ENTER AMOUNT TO BE FINANCED ";P
630 INPUT "ENTER INTEREST RATE IN PERCENT ";I:I=I/1200
640 INPUT "ENTER AMOUNT OF AFFORDABLE MONTHLY PAYMENT ";A
650 N=LOG(A/(A-P*I))/LOG(1+I)
660 PRINT N"MONTHLY PAYMENTS"
670 END
700 'MONTHLY LOAN PAYMENT
710 CLS
720 INPUT "ENTER AMOUNT TO BE FINANCED ";P
730 INPUT "ENTER INTEREST RATE IN PERCENT ";I:I=I/1200
740 INPUT "ENTER NUMBER OF YEARS OF FINANCING ";N:N=N*12
750 A=P*(I/12)/(1-(1+I/12)^-N)
760 PRINT "MONTHLY PAYMENT IS $"INT(A*100+.5)/100
770 END
800 'LOAN BALANCE
805 CLS
810 INPUT "ENTER AMOUNT TO BE FINANCED ";P
820 INPUT "ENTER INTEREST RATE IN PERCENT ";I:I=I/1200
830 INPUT "ENTER MONTHLY PAYMENT ";A
840 INPUT "ENTER BEGINNING PAYMENT NUMBER ";X
850 INPUT "ENTER ENDING PAYMENT NUMBER ";Y
860 B=1/((I+1)^-Y)*((A*(((1+I)^-Y)-1))/I+P)
870 PRINT "BALANCE AT THE END OF PAYMENT NUMBER "Y"--$"INT(B*100+.5)/100
880 AI=B-(1/((I+1)^-(X-1)))*((A*(((1+I)^-(X-1))-1))/I+P)+(Y-X+1)*A
890 PRINT "ACCUMULATED INTEREST AT THE END OF PAYMENT NUMBER "Y"--$"INT(AI*100+.5)/100
895 END
1000 'LOAN AMOUNT
1005 CLS
1010 INPUT "ENTER NUMBER OF PAYMENTS DESIRED ";N
1020 INPUT "ENTER INTEREST RATE IN PERCENT ";I:I=I/1200
1030 INPUT "ENTER AMOUNT MONTHLY PAYMENT ";A
1040 P=A*(1-(1+I)^-N)/I
1050 PRINT "YOU CAN AFFORD TO BORROW $"P
1060 END
1100 'SINKING FUND
1110 CLS
1120 INPUT "ENTER AMOUNT TO BE ACCUMULATED ";P
1130 INPUT "ENTER INTEREST RATE IN PERCENT ";I:I=I/100
1140 INPUT "ENTER NUMBER OF YEARS OF ACCUMULATION ";N
1150 A=P*I/(((1+I)^N)-1)
1160 PRINT "YEARLY DEPOSIT IS $"INT(A*100+.5)/100
1170 END

```

**-NOTICE-**

Opinions expressed in articles are not necessarily those of members of the Clackamas County T/S User Group. Meeting minutes carry the consensus of members present at meeting. This newsletter nor staff will not be held liable for any damage or consequences due to following instructions, or review of products as contained in this newsletter.

**WANTED--**

Z88 COMPUTER IN GOOD CONDITION.  
Contact Don Taylor at TAYLOR  
ASSOCIATES, 3344 S.E. 39th Ave.  
Suite 3  
Portland, OR 97202-1733  
(503) 235-6853

## SUBSCRIPTION RATES

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\$ 8.00 / 1/2 PAGE  
\$ 15.00 / FULL PAGE

ALL AD COPY MUST BE IN BY  
THE 10TH OF THE MONTH PRIOR  
TO THE MONTH AD IS TO RUN.

Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ Φ

-19-

**CCATS**  
1419 1/2 7TH Street  
Oregon City, OR 97045

ROD GOWEN (TREASURER)  
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A0003: 12<91/MLabel here>